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Safety, Total Health Day to be bigger, better

The 1997 JSC Safety and Total Health Day on Oct. 15, will be bigger and better than last year and promises to touch the lives of every employee, providing new information and reinforcing what everyone should already know about being safer and healthier.

"Safety and good health are a person's most vital assets in living a full and productive life," said Larry Neu, co-chair of the Safety and Total

Health Day Planning Committee along with Kelsey-Seybold's chief nurse, Lynn Hogan. "Recognizing this, JSC has set aside one day devoted entirely to safety and health education. We sincerely hope all employees can participate.

"There will be numerous information booths and displays that will be scattered around the pond area," Neu said. "Each booth is packed with information and the people

staffing these booths are just bursting at the seams to teach you something about their particular subject. The booths will be staffed from 10 a.m. to 3 p.m. If you come earlier than 10 a.m. we will put you to work!"

Central to Safety and Total Health Day is the program designed by individual management teams specifically for their employees' needs and interests. In most cases,

the employees themselves have contributed to this planning as well.

Employees also will be able to explore personal safety and health issues on their own. Numerous booths will be located around the pond area and in selected buildings around the JSC main site. They will be staffed by professionals armed with detailed information and hand-out material.

Please see **MAPS**, Page 8



NASA Electronic Photo STS086E5402

The new Mir-24 crew, in the docking module between the Space Shuttle Atlantis and the Russian Mir Space Station, waves goodbye to the STS-86 Atlantis crew, as the two vehicles prepare to undock. The crew, from left, includes Commander Anatoly Solovyev; U.S. Astronaut Dave Wolf and Flight Engineer Pavel Vinogradov. Wolf, giving a thumbs up, replaced Mike Foale onboard Mir, during the seventh Atlantis/Mir docking mission. Foale returned to Earth with the crew of Atlantis. Wolf will return to Earth in January after four months of research aboard the orbiting complex.

Wolf arrives on board Mir, Foale returns

Astronaut Mike Foale returned home this week with the crew of the Space Shuttle Atlantis, ending his four-month stay aboard the Russian Mir Space Station, as compatriot Dave Wolf began settling in for his long-duration stay.

"I'm leaving behind good things, not bad things," Foale said as he prepared to leave Mir, in particular the friendships he had forged with Cosmonauts Anatoly Solovyev and Pavel Vinogradov, and with their predecessors, Vasily Tsibliev and Alexander Lazutkin.

"I'm looking forward to the adventure of learning how to walk again and to live in my house with my wife and children, get to know my wife again, date her again, maybe marry her again," Foale said.

Mir's new resident, Dave Wolf, gave Foale some tongue-in-cheek advice: "Be careful down there on Earth," said Wolf, who is scheduled to return to the blue planet on STS-89 in January 1998. "It's awful close to the ground and somebody could get hurt."

Foale, Wolf and the rest of Atlantis's crew—Commander Jim Wetherbee, Pilot Mike Bloomfield and Mission Specialists Vladimir Titov, Scott Parazynski, Jean-Loup Chretien and Wendy Lawrence—worked with their

Please see **FLY-AROUND**, Page 8



Mangers, partners verify station on track

By James Hartsfield

With the first launch nine months away, representatives of the 15 nations building the International Space Station gathered in Houston recently to finalize the station's assembly sequence and confirm that construction remains on target.

"All of the partners reported they were on schedule with their contributions to the station," International Space Station Program Manager Randy Brinkley said. "The first ele-

ments, the Functional Cargo Block and the U.S. Node 1, remain on track for launches next year. In September, during a General Designer's Review for the third element, the Russian Service Module, we were reassured by the Russian Space Agency that they can meet the scheduled launch date of December 1998."

The latest assembly sequence approved by the board maintains a launch of the European Space

Agency's Columbus Orbital Facility in October 2002 and establishes the launch of a third connecting module, called Node 3, to the station. The Revision C Assembly Sequence had been approved in preliminary form during a May board meeting. The last 15 flights of the 45-flight sequence remained under review following the May meeting, pending further evaluation of launch date options for the Columbus module.

The Service Module, the first fully

Russian contribution to the station, completed a critical milestone Sept. 12 when the general designer's review was held in Moscow. Under construction at the Khronichev State Research and Production Space Center in Moscow, the module has progressed rapidly this summer. It remains on target for the December 1998 launch from the Baikonur Cosmodrome in Kazakhstan.

Manufacturing of the module will Please see **FIRST**, Page 8

Third phase of life support testing targets 90-day stay

By Linda Matthews-Schmidt

The next phase of testing of regenerative life support systems is under way at JSC as a crew of four is living and working in a closed chamber environment for 90 days to validate life support systems for future space exploration missions, such as to Mars.

Phase III of the Lunar-Mars Life Support Test Project began Sept. 19. Phase III Commander Nigel Packham, a 36-year-old Lockheed-Martin life support sys-

tem scientist; and crew members Vickie Kloeris, 41, JSC's shuttle food system manager, John Lewis, 30, a Lockheed-Martin life support system engineer; and Laura Supra, 28, an Allied-Signal life support system engineer, plan to remain in the chamber until late December.

This is the fourth in a series of tests evaluating a variety of biological, mechanical, and chemical means to recycle all their air and water, and combina-

Please see **CHAMBER**, Page 8



JSC Photo 97-12483 by Nick Nelms

The Phase III crew of the Lunar-Mars Life Support Test Project is sealed into the chamber in Bldg. 7 on Sept. 19. From left are Test Manager Burt Laws, Controls System Engineer Pat O'Rear, the Phase III crew—Life Support Systems Specialist Laura Supra, Science Coordinator Vickie Kloeris, Life Support Systems Specialist John Lewis and Commander Nigel Packham—and Chief Facility Engineer David Staat.

Mir crew installs new motion control computer

Crews exchange record amount of supplies

By John Lawrence

Russia's Mir Space Station was the recipient of benefits from Phase 1 cooperation with the United States this week as *Atlantis* delivered a record amount of equipment and supplies, including a replacement computer.

During six days of docked operations, the spacecraft crews exchanged 10,440 pounds of material. The amount included 197 resupply items (5,985 pounds) and 17 containers of water (1,717 pounds).

One of the more significant items was a replacement motion control computer. The station's primary motion control computer failed Sept. 14. A backup was retrieved from on-orbit storage, but failed to perform reliably. By stringing together the healthy components of the two faulty computers, the cosmonauts were able to jury-rig a working system that kept the station stable through docking.

After docking, the shuttle orbiter assumed attitude control of the combined *Atlantis*/Mir complex. On the third day of docked operations, Solovyev and Flight Engineer Pavel Vinogradov installed the new motion control computer in Mir's Core Module. Installation and checkout went smoothly, enabling Russian flight controllers to begin the uplink of fresh software.

The Russians also took advantage of *Atlantis*' presence to replace an onboard command exchange unit that acts as a relay between Mir's main motion control computer and the Kvant module's gyroscopes and Kurs antenna to provide increased confidence in Mir's attitude control capability.

Atlantis will bring back 64 U.S. items (1,832 pounds) and 42 Russian items (905 pounds).

New surface contamination device delivered

A new NASA device to monitor the structural health of the future International Space Station was delivered to the Russian Space Station Mir for testing by *Atlantis* on STS-86.

The Space Portable Spectroreflectometer, a device for measuring the effects of the space environment on spacecraft materials, is designed to test spacecraft materials such as those being used to construct the international station.

"The Spectroreflectometer is the first hand-held, battery-powered device of its kind," said principal investigator Ralph Carruth of Marshall Space Flight Center. "It will allow astronauts to monitor and assess the condition of actual spacecraft surfaces."

During a space walk planned for later this

year, Russian cosmonauts and a U.S. astronaut will use the device to measure how much energy can be absorbed by the thermal control coatings, or radiator surfaces, of Mir.

"Radiators, where excess heat is dumped from the space station, are a vital part of the spacecraft's cooling system," said Jim Zwiener, co-investigator for the device. "If the radiators degrade, the cooling system degrades, so these are critical surfaces."

Measurements will be used to determine the deterioration of radiator surfaces caused by the space environment and the effects of gases released from the spacecraft that collect on the spacecraft's surfaces. To take measurements, the device will be held against the space station's surface at four sites for about two minutes.

The Space Portable Spectroreflectometer was built for NASA by AZ Technology Inc.



Columbia next in line in November

By Ed Campion

Once *Atlantis* was launched on STS-86, the prime focus at KSC shifted to the final flight scheduled for 1997—*Columbia*'s on Mission STS-87.

The twenty-fourth flight of NASA's oldest orbiter will be highlighted with the deployment and retrieval of the SPARTAN-201 satellite, operations with the United States Microgravity Payload, making its fourth flight and a space walk to demonstrate International Space Station assembly and maintenance operations.

Columbia is currently in the Orbiter Processing Facility bay 2, undergoing final processing work before its scheduled rollover to the Vehicle Assembly Building around Oct. 20. Launch remains targeted for 1:46 p.m. CST Nov. 19.

As *Atlantis* and Mir orbited the Earth together, preparations also were under way for the final two shuttle-Mir missions to be flown by *Endeavour* and *Discovery*.

Endeavour, in Orbiter Processing Facility bay 1, is being prepared for STS-89 in mid-January, and *Discovery* is being readied for launch in late May 1998 on STS-91, the final shuttle-Mir mission.



NASA Electronic Photo STS086E5355

TOTE THAT BALE—STS-86 Mission Specialist Wendy Lawrence moves supplies between the Space Shuttle *Atlantis* and Mir Space Station on Sept. 30 during the seventh *Atlantis*/Mir docking mission. The two crews transferred a record amount of supplies during six days of docked operations, including a replacement motion control computer for the Russian station. Among items moved from Mir to *Atlantis* were the old Elektron oxygen-generating unit, a beetle experiment that studied changes in circadian rhythms, and biomedical experiment equipment and samples.

Mars Pathfinder exits rock garden to begin long trek

After 83 days of atmospheric, soil and rock studies, NASA's Mars Pathfinder is moving into extended mission activities that will take the rover on its longest trek yet, while the lander camera completes its biggest and best landscape panorama.

"The lander and rover performance continues to be nothing short of extraordinary," said Brian Muirhead, Mars Pathfinder project manager at NASA's Jet Propulsion Laboratory. "We have proven that we know how to design robust robots to operate in the hostile environment of Mars."

The rover has completed its last alpha proton X-ray spectrometer study for a while, taking compositional measurements of a rock nicknamed Chimp, just behind and to the left of an area scientists call the Rock Garden. Once data from the spectrometer was retrieved, Sojourner began a 164-foot clockwise stroll around the lander to perform a series of technology experiments and hazard avoidance exercises.

Meanwhile, the Pathfinder lander camera is continuing to image the Martian landscape in full-resolution color as part of its goal to provide a "super panorama" image of the Ares Vallis landing site. Each frame of this panorama is imaged using 12 color filters plus stereo.

"The super pan will be our biggest and best imaging data product," Muirhead said. "It is made up of 1 gigabit (1 billion bits) of data, of which we've received more than 80 percent. Given our limited downlink opportunities, we should have the full image by the end of October."

The 22-pound rover has survived 10 times longer than its primary mission design of seven days, while the lander has now been operating 2.5 times longer than it was originally expected to operate, according to

Richard Cook, Mars Pathfinder mission manager.

Both vehicles are solar-powered, but carried batteries to conduct night-time science experiments and keep the lander warm during the sub-freezing nights on Mars. Normal usage has fully depleted the rover's non-rechargeable batteries, limiting it to daylight activities only. The lander battery, which packed more than 40 amp-hours of energy on landing day, performed perfectly during the 30-day primary mission, but is now down to less than 30 percent of its original capacity.

"We expected to begin seeing this type of degradation on both vehicles and, of course, designed both the lander and rover to operate without batteries altogether," Cook said. "If everything else continues to operate properly, we could continue conducting surface experiments for months."

About once every two weeks, the lander battery is used to perform some night-time science experiments, he added. The primary activity is acquiring meteorological data and images of morning clouds, as well as images of Mars' two small moons, Phobos and Deimos.

Despite the lack of battery power, the rover has continued taking successful spectrometer readings during the day. In the next two weeks, engineers will drive the vehicle back to a magnetic target on the ramp from which Sojourner first touched Martian soil.

"This analysis of the dust on the ramp magnet is a very important science measurement," noted Dr. Matthew Golombek, Mars Pathfinder project scientist. "The results should give us a clue about how all this magnetic dust was formed."

Recent images and movies from Mars Pathfinder activities are posted to the Internet at: <http://marsweb.jpl.nasa.gov>

NASA names X-33 launch, landing sites

NASA has released the final environmental impact statement on the development and flight testing of the X-33 Advanced Technology Demonstrator and identified launch and landing sites.

The 273,000-pound, wedge-shaped X-33 is being developed under a cooperative agreement between NASA and Lockheed Martin Skunk Works, Palmdale, Calif., that began in 1996. It is a subscale technology demonstrator prototype of a Reusable Launch Vehicle, which Lockheed Martin has named "Venture Star," and which the company hopes to develop early in the next century.

Through demonstration flights and ground research, the X-33 will provide information needed for industry to decide by the year 2000 whether to proceed to the development of a full-scale, commercial single-stage-to-orbit reusable launch vehicle. Such a vehicle could lower the cost of putting a pound of payload into space from \$10,000 to \$1,000.

The environmental study considers issues such as public safety, noise, impacts on general aviation and effects on biological and natural resources. In the document NASA named three preferred landing sites and one preferred launch site for the X-33. Seven sites were evaluated

for potential use during the 14-month study.

The preferred launch site is located near Haystack Butte on the eastern portion of Edwards Air Force Base, Calif. The preferred landing sites identified are Silurian Lake, a dry lake bed near Baker, Calif.; Michael Army Air Field, Dugway Proving Ground, Utah; and Malmstrom Air Force Base near Great Falls, Mont.

"The study determined that the overall predicted environmental impacts of X-33 were minimal at all sites considered," said Dr. Rebecca McCaleb, director of environmental engineering and management at Marshall Space Flight Center.

Space station technology to bring expert medical care to remote areas

Soon people who do not live in or near large cities with major medical facilities will have expert medical care readily available.

Patients in remote or medically underserved areas of the country will benefit from an experiment in advanced telemedicine conducted jointly by NASA's Lewis and Ames Research Centers, and James D. Thomas, M.D., FACC, of The Cleveland (Ohio) Clinic Foundation.

Recently, a "patient" undergoing an echocardiographic examination at Lewis was "remotely" diagnosed by Thomas at Ames. He viewed a real-time display of echocardiographic video images transmitted over the broadband NASA Research and Education Network. Thomas interactively guided the technician

administering the procedure through a two-way voice link between the two sites.

"I was very pleased with the diagnostic quality of the echocardiograms," Thomas said. "Digital echocardiographic equipment will be on the International Space Station when it is operational. Echocardiography is more practical for life in space than other imaging techniques, such as magnetic resonance imaging (MRI) because it requires less power, is noninvasive, is small and versatile, and is not magnetic or radioactive. The early results of our experiment support our belief that this technology holds great promise for use in space as well as use on Earth by means of telemedicine." Echocardiography is a medical

technique that applies the methods of ultrasound imaging to the cardiac system, providing a "motion picture" of the heart in action. A small, rural clinic may have access to an echocardiograph machine but not to a technician specially trained in its operation, or to a staff cardiologist. If the clinic were connected to a major metropolitan medical facility through a high-speed communications network, a minimally trained technician could carry out the procedure under the supervision and guidance of qualified echocardiography personnel.

While many telemedicine requirements can be satisfied by the transmission of still images (e.g., X-ray photographs), the challenge of procedures such as echocardiography

is that high-resolution, moving images must be transmitted in real time. This requires a reliable broadband network and a robust data-compression mechanism.

"In the demonstration, we used the NREN to assess the clinical feasibility of conducting remote echocardiography, as well as the technical feasibility of supporting remote echocardiography, by determining the minimum network needed and the maximum video compression required to produce a transmission of high-resolution medical imagery," said Christine Falsetti, NREN project manager at Ames.

The NASA Research and Education Network is NASA's cornerstone project of the interagency Next Generation Internet initiative. In

October 1996, President Clinton and Vice President Gore announced their commitment to the NGI initiative based upon the strong research and development programs across federal agencies.

"This experiment was a step toward reaching the goals of the NGI," said David Foltz, networking project manager at Lewis. "Pushing current networking technologies to the limit helps us understand how to design, build and operate a national communications network for the future."

Reaching these goals will affect health care on Earth and will pave the way for physicians on Earth to view the heart function of an astronaut aboard the International Space Station.

JSC concentrates on Safety and Total Health for a day

Supplemental seminars provide expert presentations on issues of interest

By Rindy Carmichael

A variety of Safety and Total Health Day seminars will be presented by experts in their fields and may be used to supplement the day.

Most of the seminars will be presented in the Teague Auditorium, which will allow for large audience participation. All seminars are open seating, first-come, first served. A sign language interpreter will be present for the seminars in the Teague Auditorium.

Women's Self Defense, 9:30-10:30 a.m. and 2:30-3:30 p.m.,

Teague Auditorium—This one-hour seminar will help to identify threats to personal security and offer strategies to physically and mentally protecting against attack. The seminar is structured toward women, but men are welcome.

Crisis at Home: Gang Intervention, 11 a.m.-noon, Teague Auditorium—There have been a few problems, but not a gang... Does this sound familiar; should it? Come and hear the experts on recognizing gang activity and what can be done to bring a child to a turning point.

Managing Workplace Pressure, 9-10:30 a.m., Bldg. 1, Rm. 966; 12:30-2 p.m., Teague Auditorium—Ever changing demands, constricting work spaces, shifting work assignments and demanding performance requirements have made people feel a need to deal with and manage stress. This short seminar by Dave Schmidt from Management Development Associates will offer information and suggestions enabling employees to deal more successfully with workplace pressures.

CPR Training, 8-11 a.m., 12:30-

3:30 p.m., Gilruth Center—Employees must be at the Gilruth and signed in before the appointed time. There is no pre-registration for this class. Adult CPR will be taught by certified instructors.

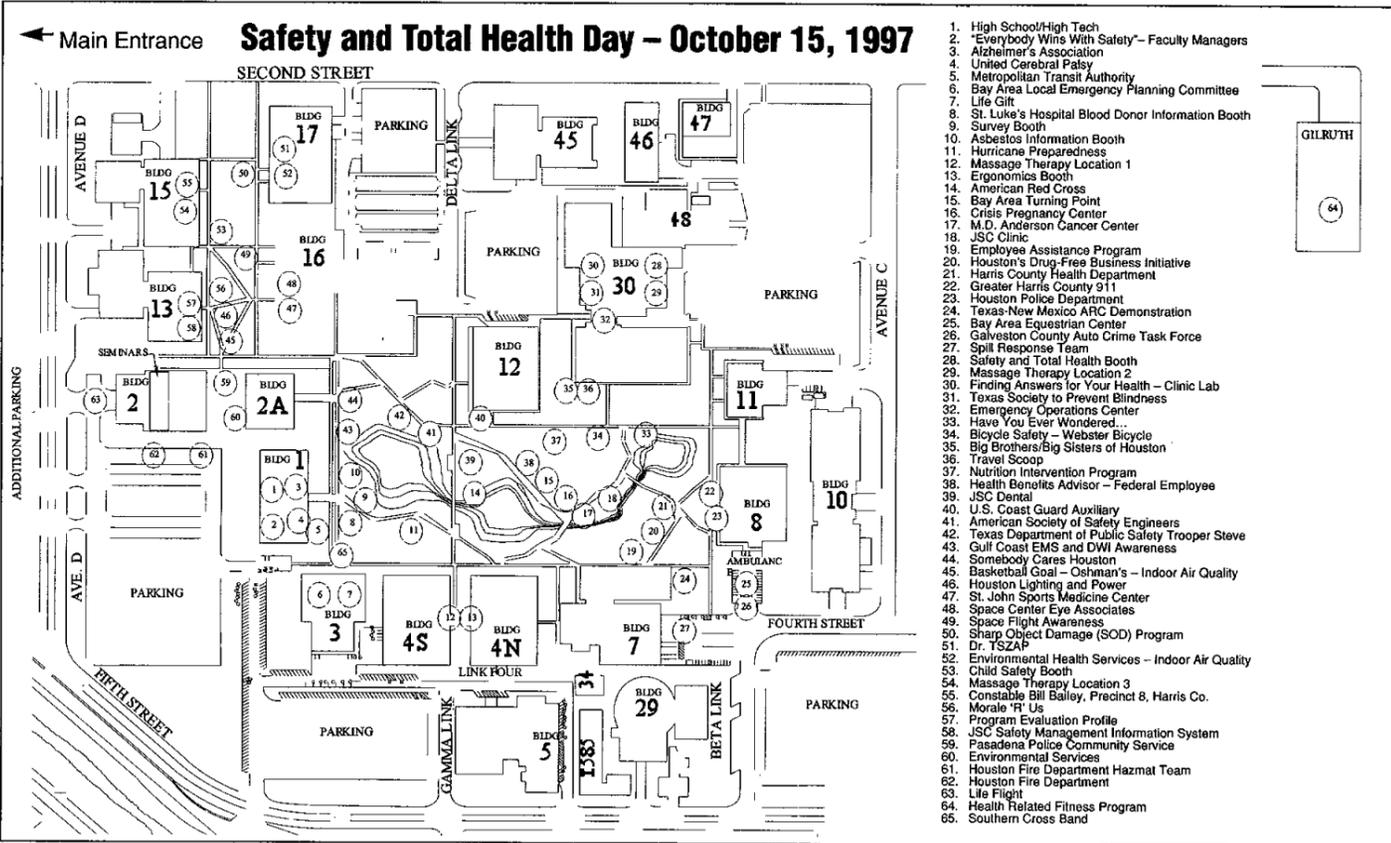
Puppet Show, 10 a.m., JSC Child Care Center—Presented by the Houston Fire Department for the youngest people on site.

Crime Prevention, 10 a.m.-2 p.m., Bldg. 8, Rm. 248—The Houston Police Department will discuss personal safety, home security, auto theft/car jacking, and burglary pre-

vention on the hour. Each session will be 30 minutes long with a question and answer session following.

Drinking, Driving, and the Consequences, 11:30 a.m.-noon, Bldg. 30 Auditorium—Not convinced about the effects of alcohol and driving? Want to know more in order to warn family and friends? Come and learn about the reality of drinking and driving.

Violence in the Workplace, 1-2:30 p.m., Bldg. 30 Auditorium—Anger: How can violence be defused in the workplace?



Registration still open

Run, walk allow fun, aid fitness

By Mary Peterson

It's a beautiful time of the year in Houston to join fellow employees in a fun run or fun walk beginning at 3:30 p.m. Wednesday, Oct. 15, at the Gilruth Center.

"Of all the options available for better health and longer life, the greatest impact is achieved by improving physical fitness," said Larry Wier, JSC director of Health-Related Fitness. "Physical exercise, such as walking and jogging, produces so many health benefits (mental and physical) that there isn't enough space to list them all. Besides being good for one's health, another benefit of regular exercise is that it just plain makes you feel good."

JSC Deputy Director Brian Duffy is expected to participate in the fun run, which will give employees an opportunity to see the new jogging track that traverses through the trees. Plenty of fresh fruit, bagels, energy bars, and cold drinks will be available.

"The walk or run completed on this day might be the start of a daily exercise program which will be a lasting benefit for the health and well-being for the rest of an employee's life," Wier said. "Everyone is a winner who participates."

Two routes have been mapped, a two-mile course for walkers and a 3.1-mile course for runners. Employees who have not already registered for the event may do so from 8 a.m.-2 p.m. the day of the run and receive a commemorative T-shirt in about two weeks, available to all participants who register and pay their \$6 entry fee.

Participation in the fun run/walk must be considered an after-work activity. Supervisors have been advised to be liberal with allowing leave to employees who want to participate in the fun run/walk. Race day registration will be at the Gilruth Center

Blood drive gives employees chance to help others

Blood donations will be accepted on both Oct. 15 and 16 in the Teague Auditorium lobby. Those who participate in the Fun Run on Oct. 15 and aren't allowed to give blood that day should give blood the next day.

Once again, T-shirts—this time with a new design and space theme—will be given to all blood donors.

The donation process starts with a nurse taking a blood sample using a single prick to a finger. Afterward, one pint of blood is drawn. The actual collection of blood takes seven to 10 minutes, with the whole process taking about 30 minutes.

After the blood is drawn, it undergoes several tests, including the tests for hepatitis and HIV. If there are reactive test results, donors are notified by mail. All results are kept confidential. Donors are encouraged to eat a low-fat meal before giving blood and to drink plen-

ty of fluids after giving blood. Usually there are no negative reactions to giving blood, but trained personnel are available in case a donor becomes light-headed. It is recommended that donors curtail heavy exercise for 24 hours after donating.

Donors may give blood every eight weeks. In some cases, a donor may be deferred if, for example, their blood is low in iron or they've been on certain medications. However, taking blood pressure medicine will not disqualify a donor. If donors have any questions about how a medical condition may affect their ability to give blood, call St. Luke's Blood Donor Center at 713-791-4483.

Besides the great feeling of helping others, donating blood offers additional benefits. Under the St. Luke's agreement with NASA and NASA contractors, the hospital provides blood assurance coverage for all

JSC personnel and their immediate families. Many examples exist where JSC employees have benefited directly from this program. Coverage includes all fees associated with blood products for blood transfused in any Houston area hospital. An immediate family is considered the spouse of an employee, any dependent children, and the parents of the employee and spouse. An employee who is a single parent receives coverage for all tax dependent children and the employee's parents. Single employees who are unmarried and without children receive coverage for themselves, their parents, and any tax-dependent siblings of their parents.

As an additional benefit to donors, approximately three to four weeks after each donation, St. Luke's will send a card with information about their blood group and type, and cholesterol level.

Southern Cross Band performs during lunch

After a busy morning of listening to briefings from line managers, visiting booths and completing safety and health checklists, JSC workers will be able to enjoy live music during their Total Health and Safety Day lunch break.

The Southern Cross Band, which plays a variety of music from the classic hits of the '60s and '70s to country and Top 40, will perform outside the Bldg. 3 cafeteria from 11 a.m.-1:30 p.m. There may even be a few people dancing, a good form of exercise.

Employees are invited to stop by the Bldg. 3 cafeteria, buy a carry-out lunch and enjoy a mealtime serenade on the lawn or visit the booths and displays close by while listening to the band.

Trash bins will be scattered throughout the area so that trash and food wrappers may be disposed of properly.

JSC Safety Alert

Blood and Emergencies in the Workplace

What Happened

A worker inspecting a fire extinguisher accidentally drops it on a toe. Blood is spilled on the floor from the injury. A worker on blood thinner sneezes, breaking a blood vessel in the nose, the result is blood on the desk, the telephone and the floor.

Outcome of the Investigation

With the heightened awareness about blood-borne diseases such as AIDS and hepatitis B, the Occupational Safety and Health Administration developed the blood-borne Pathogen Standard (29 CFR 1910.1030) that requires employers to address scenarios in which blood may be spilled in your work area. Although these situations may occur only once or twice in a working lifetime, here's what you need to know and do to protect yourself and your coworkers: For any emergency situation, JSC is supported by the Houston Fire Department and the JSC Clinic ambulance. They are the official emergency response team for medical emergencies.

What you can do

If you observe an accident or injury which involves bleeding, first call emergency response at x33333. If the person is conscious, and needs assistance, you may provide them something to stop the bleeding. However, any rendering of first aid or CPR on your part is done strictly on a voluntary basis. Do not expose yourself to the injured person's blood or body fluids. Wait for the emergency personnel to arrive. Ensure that someone stands by to secure the area to keep unsuspecting personnel from coming into contact with or slipping on any spilled blood that may be present. Do not attempt to clean up any blood or body fluids. Cleanup of the blood will be conducted by the emergency response personnel. When security or fire protection personnel arrive they will take over the security function. If you have any further questions, call the occupational Health Office at x37896 or the JSC Clinic at x34111.



total health

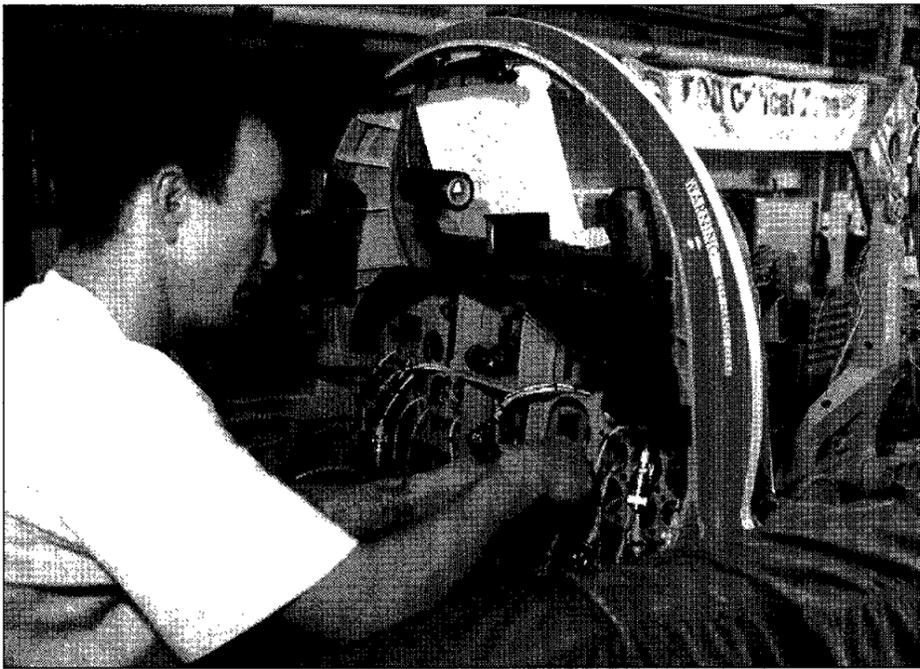
For more information:

Safety
Larry Neu x32865

Total Health
Lynn Hogan x37790

Blood Drives
Marty Demaret . x36007
Dan Mangieri . . x33003

Fun Run/Walk
Larry Wier . . . x30301
Greta Ayers . . . x30302
Lesa Lester . . 244-1628



JSC Photo S97-10703

Top: Paul Trout, a DynCorp employee, installs new avionics hardware into one of NASA's T-38 astronaut training aircraft. The work was taking place in Ellington Field's Hangar 990. Right: A prototype ejection seat is suspended above a T-38 in Hangar 135 as, from left, DynCorp's James Lee, Air Force Crew Systems Officer Larry Rogers of Wright-Patterson Air Force Base, and Peter Winwright of seat manufacturer Martin-Baker, monitor the operation. In the foreground is the old ejection seat, which was re-installed after the test. Below, the WB-57F crew prepares for a flight in the high-altitude research aircraft. From left are NASA's Scott Reagan, DynCorp's Don Greenway and Luther Levan, Pilot Rick Hull, NASA's Frank Newman, DynCorp's Chris Sanzibal, Systems Engineer Shelley Hilden and NASA's Bud Meins. Bottom: DynCorp employee Steven Burris, adjusts new T-38 digital avionics package, comparing its output to the old analog system's.



JSC Photo S97-10700



JSC Photo S97-10706



JSC Photo S97-10710

Flying Farther

Ellington Field workers stretch limits of aging aircraft fleet to ensure safety, support space flight objectives

[Editor's note: These two articles about are the first segment in a two-part series that looks at Ellington Field's contributions to America's space program and the challenges ahead. Next week: Maintaining and upgrading NASA's T-38 training aircraft fleet.]

By Elizabeth Soutter

Keeping pace with America's space program is the job of JSC's Aircraft Operations Division at Ellington Field, and today that means both supporting human space flight operations and finding ways to use the ever-expanding technology that springs from them.

As NASA moves from exploring space to finding ways of developing it and living in it permanently, the Aircraft Ops team at Ellington is constantly "pushing the envelope" of its equipment and its human capabilities while embracing commercial advances rooted in space technology.

Aircraft Ops resides on 37 acres at Ellington Field, housing 375 employees in 15 buildings. In addition to the 85 federal employees working at Ellington Field and at the El Paso Forward Operating Location, there are 55 Lockheed Martin employees who develop, test and maintain the Shuttle Training Aircraft simulation system and 235 DynCorp employees who maintain JSC's fleet of 40 aircraft.

"Aircraft Operations exists to support the space shuttle and space station programs through zero-g evaluation and operations testing and to provide flight readiness training and instructing astronaut pilots in landing the orbiter," said Deputy Director of Aircraft Operations David Finney.

The work of Ellington Field personnel is exacting and critical to the safety of the passengers and pilots aboard JSC's aircraft. Workers at Ellington Field maintain, fly and rebuild portions of the planes that are flown by astronauts and instructors every day.

Airplanes in the hangars are peppered with fluorescent orange flags—warnings affixed to hardware to remind crew not to take off without checking them.

"A T-38 engine is turning at 16,000 revolutions per minute. If a worker were to leave a scrap of metal inside an engine, it would ruin it. All it takes is a single pebble to destroy an engine and put people in jeopardy," said T-38 maintenance officer Jose Rangel.

To support its mission, Aircraft Operations maintains 40 aircraft including 30 modified Northrop Grumman T-38 high performance jet aircraft trainers. To maintain flying proficiency, each of 140 astronauts flies approximately 15 hours a month in the T-38s. Each aircraft needs a major maintenance overhaul about every nine months. DynCorp maintenance crews work to keep an average of 22 of these aircraft constantly in service.

NASA owns the first T-38 to come off the assembly line in 1959. T-38s were not manufactured after 1968, so all of NASA's T-38's are at least 29 years old. It is anticipated that Aircraft Ops modifications will keep the T-38's flying until the year 2040—a total of about 72 years. The present record holder for the useful flying life of an aircraft is the DC-3, the last of which was built in 1934 and some of which are still flying. With the advantage of Aircraft Ops care, the T-38 may well eclipse the record.

Ellington workers have made more than 30 modifications to the T-38s in the past several years. Major modifications, being implemented now, will involve new designs and modern hardware additions. Among these are: structural changes to the bulkheads and engine inlets to enhance the aircraft's utility and safety, and changes to enhance pilot operability and make the cockpit safer and more efficient as part of the nearly completed avionics upgrade program. Future modifications include the incorporation of new engine inlets to improve aircraft performance in the event of

engine failure and new ejection seats to accommodate a wider range of air crew.

Ellington's zero-gravity training takes place in the KC-135, familiarly known as the "Vomit Comet." The aircraft simulates microgravity by climbing rapidly to an altitude of 32,000 feet and then pushing over to plummet toward the Earth at a rate of 432 miles per hour. At the top of each parabolic curve, occupants experience a free fall that is similar to weightlessness. The speed and repetition of the parabolas can confuse the human inner ear and cause severe motion sickness, hence the aircraft's nickname.

One of the less well-known aircraft at Ellington Field is the WB-57F. Created as a weather reconnaissance aircraft, the WB-57F has been used by NASA recently to test the effects of solid rocket plume gases on the environment. This airplane flies to unusually high altitudes—up to 68,000 feet—where it tests atmospheric gases and ozone. WB-57F pilots operate under a sky turned purple by the thin band of atmosphere between them and the darkness of space. Unlike passengers aboard an airliner that flies no higher than 40,000 feet, passengers aboard this aircraft must wear pressure suits to prevent their blood from boiling.

Ellington Field personnel also have the mission to train astronaut pilots to land the space shuttle orbiter. Four modified Grumman Gulfstream II aircraft, called Shuttle Training Aircraft, are designed to simulate orbiter landings from an altitude of 35,000 feet to touchdown. The interiors of these planes have been modified to the same configuration as the orbiters. An engineer in the back of the plane uses a computer to simulate landing conditions while a pilot instructor and pilot astronaut practice landing the aircraft on shuttle landing runways at the White Sands Test Facility, Edwards Air Force Base and Kennedy Space Center.

Because the orbiter does not have engines for landing, the astronauts must steer the craft to a perfect landing on the first attempt. This unpowered, or "dead stick," landing takes hours of training to perfect.

In addition to its training and test aircraft, Ellington Field also houses a NASA-2 mission management aircraft that transports passengers to other NASA facilities. Two modified Boeing 747 Shuttle Carrier Aircraft also are part of the JSC fleet, although they are housed at Edwards Air Force Base and maintained by a team of DynCorp personnel.

Ellington Field boasts a full compliment of technicians, engineers and mechanics to support its operations. Aircraft Ops personnel are charged with ensuring that the astronauts are provided a safe, efficient and effective training environment. DynCorp was selected as the JSC nominee for the George M. Low Outstanding Contractor Award. Selected for their motivational leadership, outstanding product quality, superb labor standard and imaginative cost savings initiative, DynCorp contractors have been hailed by NASA as superlative.

"By every measure of effectiveness, DynCorp's performance has been worthy of recognition," said Aircraft Operations Division's David Finney. "An unusually high number of astronaut candidates has created a higher demand on DynCorps technicians. The contractors have consistently responded to an increased workload without any increase in cost. Performance, safety, and cost savings have remained at the highest standards, in spite of the highest ever tempo of operations."

Ellington Field has contributed to NASA's mission since the creation of the Manned Spacecraft Center in 1962, but its heritage goes back to the earliest days of aviation. In 1962, NASA obtained a portion of the airfield from the Air Force and began astronaut training operations. Ellington Air Force Base was deactivated in 1976. NASA retained its portion of the airfield, as did several military occupants such as the Texas Air National Guard.



JSC Photo S97-10702



JSC Photo S97-10701



JSC Photo S97-10705

High-flying engineer helps pick new ejection seat

Finds Ellington Field culture based on interdependency, teamwork

By Elizabeth Soutter

As the sun rose over Ellington Field the morning of the STS-85 launch, a seven-member team comprised of pressure suit technicians, ground crew mechanics, an electrician and a quality officer continued work they had begun the night before to prepare two people for a single flight to Florida.

The flight would pass over the Kennedy Space Center at 60,000 feet, flying through the plume of vapor left behind after *Discovery* thundered into space.

At this altitude, the air is too thin for ordinary engines and wings. Ellington's WB-57F high weather/reconnaissance aircraft, however, has a wingspan of 122 feet. A cramped cockpit is perched between the wings, which are powerful enough to lift the plane to 68,000 feet, at the top of the troposphere.

This altitude means special considerations must be made for human cargo.

"Once you're at an altitude of 50,000 feet, if you don't have pressurized oxygen going into your lungs, you'll experience rapid unconsciousness," says WB-57F Assistant Project Engineer Shelley Hilden. "But it's really an issue at 63,000 feet. That's right about the point where the barometric pressure is less than your tissue pressure. So at 63,000 feet if you were to lose cabin pressure, your tissues would vaporize and your blood would boil."

To prevent such an occurrence, occupants of the WB-57F wear pressure suits. "If the cabin depressurizes, the suit would inflate and keep the pressure around my body," Hilden says.

Similar in appearance to the ones astronauts wear during shuttle ascent and entry, the fluorescent orange suit must be worn throughout the six-hour mission.

"I told the pilot I was waiting for him to turn off the fasten seatbelt sign so I could move about the cabin," Hilden joked. "Obviously that's just not possible seeing as the cockpit is just a little bigger than I am. It's not very comfortable. But it doesn't bother me at all."

Hilden's addiction to high-tech aircraft began during her years as a co-op at JSC. An aerospace engineering major at the University of Minnesota, Hilden became interested in NASA in her Freshman year. She wrote to all

the NASA centers in the country, requesting information on co-op and internship programs. She was accepted to the JSC program in 1992.

Hilden first saw Ellington Field as part of an educational tour with the Co-op Tours and Lectures series. Ellington Pilot Jack "Triple" Nickel was showing students the T-38 jet aircraft trainer. Hilden was entranced by it.

While it was years before she flew a T-38, Hilden did arrange for her next tour to be at Ellington, working Shuttle Training Aircraft software. In 1994, she joined Ellington as a full-time engineer. Six months later, Hilden became assistant project engineer for the WB-57F and found herself in an orange pressure suit at 65,000 feet monitoring data collection on the atmosphere.

"I was very excited to work on the WB-57F," Hilden says. "I finally had a great project I could sink my teeth into and learn a lot from and be inspired to work."

Since then, she has logged 75 hours in the high-altitude research aircraft. This new job has an added bonus for Hilden—she has logged 20 hours of air time in T-38s, the result of crew change-outs during long deployments for the WB-57F. She and one pilot will fly the T-38 to rendezvous with the WB-57F, and the other pilot and engineer will fly the jet back.

Hilden has found an entirely unique way of life at Ellington Field, based on interdependency and team work.

"In any kind of spacecraft or aircraft work you are dependent not only upon the hardware, the software, the technology that goes into building your vehicle, but also on the people. There has to be a very large emphasis on safety. There has to be. What we are doing is inherently dangerous."

When Hilden flies aboard the WB-57F, she

is aware that her safety is in the hands of the pilot flying the plane and the engineers and mechanics supporting her flight.

"My life is dependent upon the suit technicians. If they give me a faulty suit and we lose pressure at 60,000 feet, I'm a pink mist in the cockpit." Ellington pilots, she adds, "are calm and collected and have no doubts in the aircraft. It's very reassuring."

Hilden has herself recently taken the burden for the safety of others. She and logistician and maintenance officer Jose Rangel have been charged with finding a new T-38 ejection seat.

Hilden and Rangel have been working together on this project for nearly six months. They began by researching the function of an ejection seat. A presentation by an Air Force official illustrated the importance of her assignment.

"He gave us a presentation on new ejection

seat technology and what we should be looking for in a new seat. The last slide was a picture of a pilot and the pilot's spouse. And I thought: 'This is why we are doing this. We are doing this to save lives. We're doing this so that if this pilot has to eject, this pilot will have the greatest chance of surviving.' We want the pilot to be able to pull the handle and go and not have to think about it. We're doing the work now so they don't have to later."

Ejection is not a gentle process. The two cockpit canopies and the aft and forward seats are blown clear of the aircraft. A spring loaded drogue chute on each seat keeps it from spinning as its occupant is released from the seat harness and the barometric parachute deployment system is armed. At or below 14,000 feet, a charge deploys the parachute that almost instantly slows the user's fall from 200 to 10 feet per second. All told, five explosions

and two violent decelerations accompany the use of this particular safety feature.

Hilden and Rangel have brought in five companies from the United States, the United Kingdom and Russia to demonstrate the newest innovations in ejection seat technology.

The current seat, installed by the airplane's manufacturer, Northrop Grumman was designed in 1959. Hilden's assignment is to look at the anthropometrics of the new seat—that is, its compatibility with a wide range of body types.

"It's not just a question of women," Hilden says, "but of all smaller crew members. A seat that doesn't account for a lot of different body shapes is going to hurt people."

Finding a seat that allows for people of different height and weight has some complex factors involved. The user must be fairly comfortable, and able to reach all the controls inside the aircraft. In addition, the rocket and the man-seat separator system must be able to accommodate the different centers of gravity that come with differing body size.

Hilden and Rangel are looking for a seat that will be dependable at zero altitude and zero speed. A so called "zero-zero" seat would enable crew members to evacuate an aircraft that was still on the runway. They must also consider the timing involved in safe ejection.

"In the current system," Hilden says, "the pilot in the front seat has to say to the passenger in back, 'You go on two, I go on three, one-two-three.'"

If there is a miscommunication or error and the person in front ejects first, the gases from the ejection seat may burn the passenger in the rear cockpit. There also is potential for a mid-air collision. Many of the seats the team is looking at prohibit the forward passenger from ejecting first and eliminate the need for passengers to wear individual parachutes.

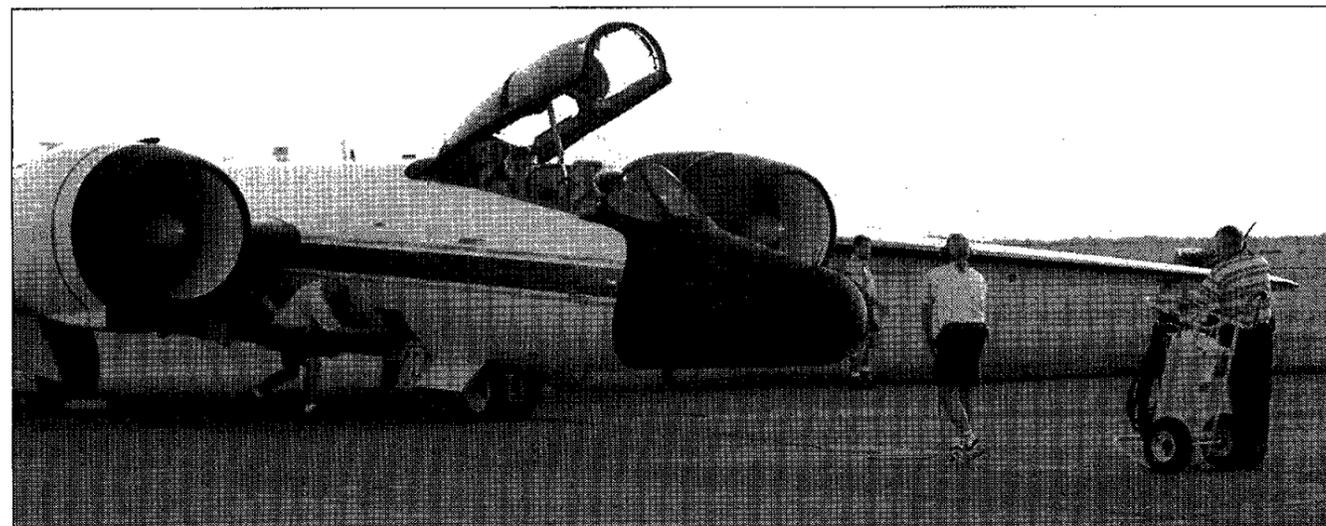
The current system, with the pilot and passenger wearing their parachutes on their backs, is not only uncomfortable, it is not as dependable as a chute packed in the ejection seat head box.

Hilden's commitment and enthusiasm are evident when she speaks of her experience at Ellington Field. "It all comes down to people," she said. "In the end, working out here is about keeping people safe and keeping them flying."



'In any kind of spacecraft or aircraft work you are dependent not only upon the hardware, the software, the technology that goes into building your vehicle, but also on the people.'

—Shelley Hilden
WB-57F Assistant Project Engineer



JSC Photo S97-10707

Top left: NASA Flight Engineer John Lamb, left, and co-workers Chris Sanzibal, of DynCorp, and Scott Reagan, of NASA, go through a pre-flight checklist prior to a WB-57F high-altitude flight to collect air samples at Kennedy Space Center following a space shuttle launch and test the effects of solid rocket plume gases on the environment. Top center: WB-57F Pilot Rich Hull, left, and systems engineering officer Shelley Hilden, also WB-57F assistant project engineer, get suited up for their flight as DynCorp suit technician Sanzibal performs pressure checks on the suits. Top right: From left, DynCorp's James Lee, and Bill Harrison, Brian Miller, and Peter Winwright, all of seat manufacturer Martin-Baker, lift the prototype ejection seat from the T-38 aircraft in Ellington Field's Hangar 135. Left: The cockpit of the WB-57F is ready to be closed prior to flight as, from left, DynCorp electrician Walt Townley, and mechanics Louis Valle and Luther Levan, and NASA Quality Assurance and Mission Manager Bud Meins make a final inspection of the aircraft just before takeoff.

JSC Photos by Steve Candler

34 Years Ago at MSC

Electronics equipment for MSC's Mission Control Center to be provided by Philco

[Reprinted from the Oct. 16, 1963 Space News Roundup]

Philco Corporation, which has supported the government of the United States through its research and development in electronics and communications for more than half a century, assumed a major role in the manned space flight effort this year with receipt of a \$33.8 million contract from the National Aeronautics and Space Administration to implement the Mission Control Center at the Manned Spacecraft Center.

A subsidiary of Ford Motor Company, Philco will provide the Mission Control Center (MCC) the complicated electronics equipment necessary to support communications, simulation, checkout and training, and control and display. (The Real Time Computer Complex used to support these systems is being built and will be maintained by IBM).

When completed in 1964, the MCC will serve as a centralized control center for the direct support of manned space flight. The first operational missions to be supported by the center will be Gemini rendezvous flights. Integrated in concept and design, the MCC will be capable of complete support of the Apollo earth-orbital and lunar missions.

Philco's work in the design, development and integration of systems in the Mission Control Center is under the direction of its Western Development Laboratories Division at Palo Alto, Calif., headed by Oscar T. Simpson, Philco vice president and WDL general manager. Dr. Walter B. LaBerge is General Operations Manager, heading Philco Houston Operations headquartered in the Main Building in downtown Houston. The company has about 250 employees in Houston.

Four other Philco organizations are providing manpower and other support on the MCC contract. They include the Communications and Electronics Division, the TechRep Division and the Philco Scientific Laboratory, all in the Philadelphia area; and Aeronutronic Division at Newport Beach, Calif.

Work on the project is being done

at those locations as well as in Houston. Philco previously had been awarded the NASA contract for a design and development study of manned space flight operations and control and support. As a supplement to the MCC contract, the Philco Houston Operations, headed by T. L. Kraft, is engaged in a continuing study of support concepts and requirements for manned space flight beyond Gemini and Apollo.

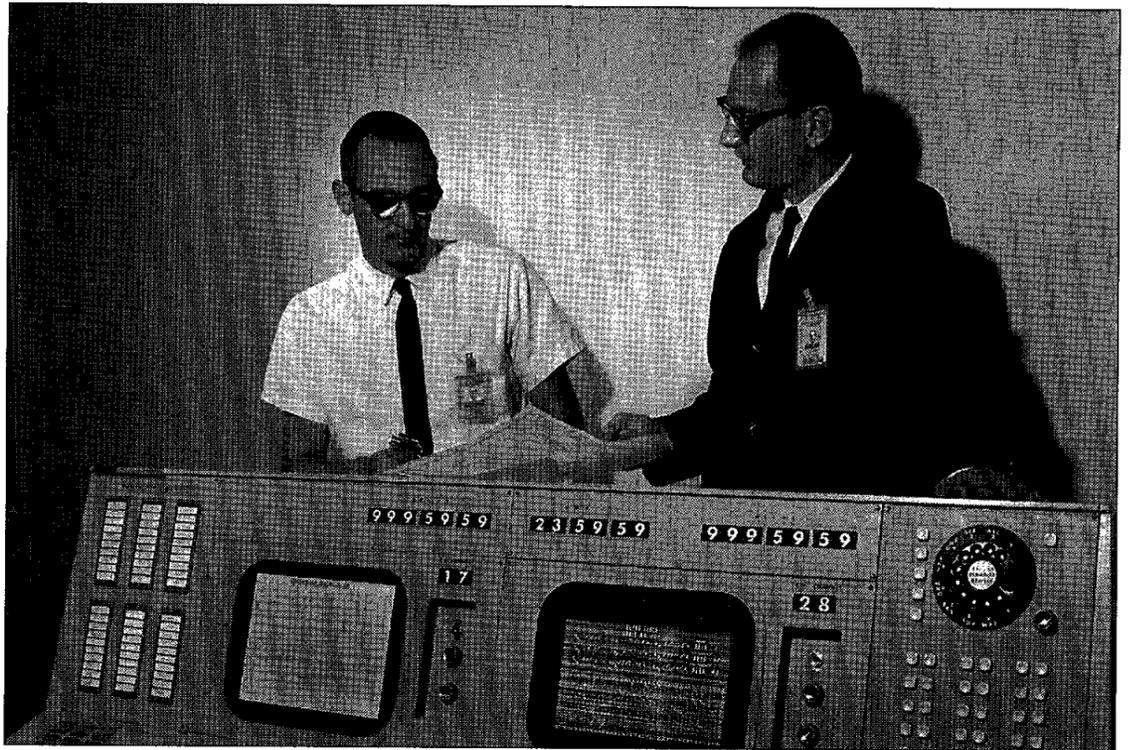
Both Philco and its parent firm, Ford Motor Co., were prominent in developments forerunning the space age—Philco in communications and electronics; Ford as a pioneer in aviation. Both have been active in space since the early days of the U.S. aerospace program. Philco's WDL developed Courier, this nation's first active communications satellite. Aeronutronic, then a division of Ford, worked with NASA on Ranger.

Philco Corp. was founded in Philadelphia in 1892 as the Helios Electric Company and was known for a number of years as Philadelphia Storage Battery Company. "Philco," first a trademark, became a part of the corporate title in 1940.

The company first contributed to the U. S. defense effort in World War I by supplying batteries for portable field radio sets used by the U. S. Army. In the 1920s the firm turned from the development and manufacture of batteries and battery chargers for home radios to the production of radios.

With so much experience in providing goods and services in civilian communications, it was natural for Philco to expand its production into the more sophisticated electronics area demanded by World War II, later by government and industry, and now by the aerospace program.

During the war the company produced artillery shells and fuses, Bazooka rockets and fuses, radio and electronic communications equipment, ground and airborne radar equipment. Through what later became the TechRep Division the company contributed to the war manpower effort through the training of radio and radar technicians and ser-



MCC CONSOLE—Tom Fisher (right) and Grier Oberholtzer, Philco Houston Human Factors Department, discuss early conceptual design changes for the Flight Dynamics Officer's console. This and sixteen other consoles are planned for the Mission Operations Control Room of MSC's Mission Control Center.

vice by its own personnel in the field. These civilian technicians installed and maintained complex radar and communications equipment for the Armed Forces in the U. S. and in combat zones in both World War II and the Korean conflict.

Approximately 3,000 Philco Tech-Rep engineers and technicians—now are providing technical assistance to military, industrial, governmental and educational agencies about the globe, and to such Philco projects as implementation of the MCC. A TechRep served as a monitor at each tracking station on every flight of Project Mercury. The wartime production performance which brought Philco 21 "E" awards also gave it a commanding post-war position in electronics and led eventually to the founding of the Communications and Electronics Division and Western Development Labs.

The Communications and Electronics Division, with research, advanced development and engineering facilities in Philadelphia and Blue Bell, Pa., developed and produces the Sidewinder missile; makes fuses for other missiles; develops, builds, installs and maintains world-

wide radar detection and communications systems; and display and data processing systems.

Philco's WDL Division, established just a little over six years ago, now has some 2,500 employees who work in a complex of modern buildings on a 24-acre site in Palo Alto. The division serves as systems manager for space programs, and designs, engineers and develops both earthbound and planetary unmanned spacecraft vehicles and systems, and communications and instrumentation sub-systems for manned spacecraft. It also serves as systems manager for large command and control systems for mission control of space operations (as in MCC); designs, engineers, builds and installs radio astronomy telescopes and antennas used in aerospace.

The division holds a current contract from NASA for a design study of an Advanced Solar Probe. The study could result in the most sophisticated unmanned spacecraft yet developed. It not only requires precise scientific instrumentation with stringent requirements for accuracy, but it has to operate under extreme environmental conditions (within 28 million miles

of the sun) to which no previous spacecraft has been subjected.

With the transfer of Aeronutronic to Philco this year, Philco gained greater depth in engineering, development, manufacture and management of space, missile and weapon systems, electronics, display and storage equipment.

Aeronutronic has an important role in the MCC project—providing the display system section including a group display system, keyboards for use in selecting displays and interface equipment to connect the various display systems to the center's computers.

As an extension of its earlier lunar capsule work, Aeronutronic has been awarded a contract for a space capsule camera scanning System that would provide photographs showing fine detail of the moon's surface.

The division also is doing a study for NASA on requirements for a Martian "taxi," the Mars Excursion Module (MEM). Carried by a larger spacecraft, MEM would be designed to taxi astronauts between the spacecraft and the planet Mars, around which the spacecraft would be orbiting.

Gilruth Center News

Hours: The Gilruth Center is open from 6:30 a.m.-10 p.m. Monday-Thursday, 6:30 a.m.-9 p.m. Friday, and 9 a.m.-2 p.m. Saturday.

Sign up policy: All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a yellow Gilruth or weight room badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

Gilruth badges: Required for use of the Gilruth Center. Employees, spouses, eligible dependents, NASA retirees and spouses may apply for photo identification badges from 7:30 a.m.-9 p.m. Monday-Friday; and 9 a.m.-2 p.m. Saturdays. Cost is \$10. Dependents must be between 16 and 23 years old.

Hatha Yoga: A stress relieving, stretching and breathing exercise routine to unite body, mind and spirit. Classes meet from 5:30-6:30 p.m. Thursdays. Cost is \$40 for eight weeks.

Nutrition intervention program: A six-week program to learn more about the role diet and nutrition play in health, including lectures, private consultations with a dietitian and blood analysis. Program is open to all employees, contractors and spouses. For more information call Tammie Shaw at x32980.

Defensive driving: One-day course is offered once a month. Pre-registration required. Cost is \$25. Call for next available class.

Stamp club: Meets at 7 p.m. every second and fourth Monday in Rm. 216.

Weight safety: Required course for employees wishing to use the weight room will be offered from 8-9:30 p.m. Next class is Oct. 23. Pre-registration is required. Cost is \$5. Annual weight room use fee is \$90. Additional family members are \$50.

Exercise: Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Aikido: Introductory martial arts class meets from 5:15-6:15 p.m. Tuesday and Wednesday. Cost is \$35 per month. New classes begin the first of each month.

Step/Bench aerobics: Classes meet from 5:15-6:15 p.m. Monday, Tuesdays and Thursdays. Cost is \$32 for eight weeks. Kristen Maidlow, instructor.

Ballroom dancing: Beginner classes meet from 7-8:15 p.m. Thursdays. Intermediate and advanced classes meet from 8:15-9:30 p.m. Cost is \$60 per couple.

Country and western dancing: Beginner class meets 7-8:30 p.m. Monday. Advanced class (must know basic steps to all dances) meets 8:30-10 p.m. Monday. Cost is \$20 per couple.

Fitness program: Health Related Fitness Program includes a medical screening examination and a 12-week individually prescribed exercise program. For more information call Larry Wier at x30301.

Gilruth Home Page: Check out all activities at the Gilruth online at: <http://www4.jsc.nasa.gov/ah/exceaa/Gilruth/Gilruth.htm>

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday and in the Bldg. 3 Exchange Store from 7 a.m.-4 p.m. Monday-Friday. For more information call x35350 or x30990.

Galveston Storm vs. Corpus Christi Sharks: Southwest Basketball League, 7 p.m. Nov. 7, Moody Gardens Convention Center, regular seating \$20, VIP seating \$40, on sale through Nov. 1.

EAA Wurstfest Bus Trip: Nov. 8, \$20, on sale through Oct. 31.

EAA Texas Renaissance Festival Bus Trip: Oct. 25 and Nov. 15, adults \$17.50; children (5-11) \$11; under 5 (but need bus seat) \$5; on sale through Nov. 14.

Texas Renaissance Festival: adults, \$12; children 5-12, \$5.50.

EAA Grand Casino Coshatta Bus Trip: Oct. 26, \$5, no sale through Oct. 17.

EAA Halloween Dinner/Dance: Oct. 25, Gilruth Center; \$15, on sale through Oct. 22.

Astroworld: \$19 Blue Light Special, valid only in Houston, through Jan. 4.

Moody Gardens: Tickets are \$9.50 for 2 of 4 events.

Seaworld: Adult \$27.25; children (3-11) \$18.25.

Space Center Houston: Adult \$8.95; children (4-11) \$6.40 JSC civil service employees free.

Movie discounts: General Cinema, \$5.25; AMC Theater, \$4.50; Sony Loew's Theater, \$4.75.

Shirts: JSC logo T-shirt, \$10, polo style, \$23; International Space Station logo golf shirts, \$26 and \$28.

Stamps: Book of 20, \$6.40.

1998 Franklin Planner replacement refill orders being taken now.

Metro passes: Tokens and value cards available.

Suddenly Tomorrow Came: A History of Johnson Space Center, book available.

Upcoming events: EAA Spring Break Ireland Trip: March 21-29, \$1,399 per person, double occupancy (\$200 deposit per person, final payment due Jan. 21).

Nearly 100 employees earn JSC's highest commendation

JSC employees will receive some of the center's highest accolades during the JSC Honor Awards Ceremony at the Gilruth Center Ballroom at 3 p.m. Oct. 16.

The JSC Certificate of Commendation, JSC's highest honorary award, will be presented to approximately 90 employees. JSC Director George Abbey, JSC Deputy Director Brian Duffy and the appropriate program manager or director will present the awards.

Recipients are encouraged to invite family members, friends, and fellow employees to attend the ceremony with them. Following the ceremony, there will be a reception for award recipients and their guests.

Supervisors are encouraged to allow JSC civil service and contractor employees to attend as their workloads permit. For further information regarding the ceremony, contact Helen Harris at x38413, or the organization's Administrative Officer.

The recipients of the 1997 Certificate of Commendation are:

Office of the Director: Susan H. Garman.

Human Resources Office: Julie A. Barnes and Robert P. Musgrove

Office of the Chief Information Officer: Richard A. Weller.

Legal Office: Daniel R. Remington.

Business Management Directorate: Carol A. Homan, Jimmy W. Hyde, Nancy I. Kennamer, Ester F. McFarland, Christine L. Mack, Juan F. Rosales Jr., Michael S. Soots, James D. Shannon and Aimee L. Stephens.

Flight Crew Operations Directorate: Kathleen M. Abotteen, Melba

M. Borhani, Alyson M. Hickey and Gerald J. Kraynik.

Mission Operations Directorate: Mukwatsibwoha L. Alibaruho, Edward M. Burns, Peter J. Cerna, Renato D. Dell'Osso Jr., Michael E. Donahoo, Robert E. Floyd, Annette P. Hasbrook, Rebecca L. Kirk, Xuan-Trang T. Le, Paige H. Lucas, Franklin S. Markle III, Nadine Papaila Naisbitt, Gerald L. Shinkle, J'Ann H. Siders and Brock R. Stone.

Engineering Directorate: Janet W. Bell, Richard D. Burghduff, John E. Burke, Phillip S. Callen, Liese Dall-Bauman, Ph.D., Horacio M. de la Fuente, Carol T. Evans, Daniel A. Harrison, Gregory C. Hite, Ph.D., Eric A. Hurlbert, Bradley W. Irbeck, Kathleen E. Jurica, Dayton D. Kane, Henry J. G. Kaupp Jr., Garlan B. Moreland, Hai D. Nguyen, Leonard S. Nicholson, Reagan S. Redman,

Ned J. Robinson III, Hector I. Rodriguez, Chad R. Rowe, Charles L. Salkowski, Jenny M. Stein, Lisa Y. Stephens, Scott A. Swan, Harold A. Vang, Philip R. West and Eugene Winkler.

Information Systems Directorate: Robert B. Jones III, Frank E. Martin, Ph.D., Robert D. Neil and Richard A. Thorson.

Technology Transfer & Commercialization Office: Robert L. Dotts.

Center Operations Directorate: Jon A. Kerr, Michael J. Scott, Pedro A. Vasquez, Karen L. Wyont.

Office of the Chief Financial Officer: Patricia A. Caballero, Clifton J. McCarra, Cynthia S. Neal, Ralph Schomburg and Martha C. Speller.

Space Shuttle Program Office: David L. Ladrach, David D. Lee, Arthur Reubens and Raymond E. Sanders.

Safety, Reliability, & Quality Assurance Directorate: Robert G. Alexander and Louis K. Barrera.

International Space Station Program Office: William F. Dillon Jr., James D. Drewry Jr., Amy J. Fisher Ronalds, Elizabeth A. Hall, Joey D. Shelton, Robert Y. Wang, Ph.D., and Carolyn A. Woolverton.

White Sands Test Facility: Harold D. Beeson, Ph.D., and Richard V. Lopez.

Space and Life Sciences Directorate: Glen Branch Jr., Carolyn G. Fritz, Michael J. Golightly, Dennis J. Grounds, Karen M. Morrison and Diana T. Norman.

Space Operations Management Office: Keith A. Williams.

EVA Project Office: James V. Thornton.

Phase 1 Program Office: Frank L. Culbertson Jr.

Exchange Stores to offer bargain photo processing

JSC's Exchange Stores will offer a special photo processing bargain for one week only, Oct. 20-24.

To take advantage of the special, employees need only drop off their film at the Bldg. 3 or 11 Exchange Stores.

The special discount prices will allow employees to process their film and receive prints at the following rates:

- \$2.99 for 3-inch double prints from 12, 15, 24, or 36 exposure color rolls.

- \$3.99 for 4 inch double prints for 12, 15, 24, or 36 exposure color rolls.

The special discount prices are effective for everything *except* black and white, panoramic, half frames or advanced photo systems processing.

The photo processing service is provided to the JSC Exchange by Fuji TruColor, Dallas.

For more information, contact the Bldg. 3 Exchange Store at x37362, or the Bldg. 11 Exchange Store at x35749.



JSC photo 97-10809 by Steve Candler

Carrie Lach receives the Marilyn J. Bockting Award. From left are co-workers Diane Hawkins and Candy Hunt, Human Resources Development Branch Chief Diane DeTroye, JSC Director George Abbey, Lach and Human Resources Director Harv Hartman.

Lach earns top secretary award

Carrie Lach of the Human Resources Development Branch in JSC's Human Resources Office recently received the Marilyn J. Bockting Awards for secretarial excellence.

Lach was hailed as a vital link in the success of her branch's responsibilities and function due to a "superior customer service focus which she combines with an

eagerness to learn new tasks and take on new responsibilities."

Lach's efforts have resulted in a higher level of computer responsiveness throughout the office, the award nomination stated, verified by frequent compliments on her enthusiasm and helpfulness from customers to the office's management. She also shared her knowledge with coworkers.

Baker becomes Russia liaison; Cockrell heads Astronaut Office

Veteran Astronaut Mike Baker has been appointed to the new position of assistant to the center director for human space flight programs, Russia, and fellow Astronaut Ken Cockrell has been assigned to head the Astronaut Office.

Baker, a Navy captain, will oversee and direct all JSC human space flight activities in Russia. These activities include International Space Station training, operations, technical liaison, and logistics. Additionally, he will serve as the JSC director's personal representative to NASA's partners in Russia. Baker will be permanently located at the NASA offices at the Russian Embassy compound in Moscow, and will spend a good deal of time at the Gagarin Cosmonaut Training Center in Star City and the Mission Control Center in Korolev.

Baker joined NASA in 1985 as an

astronaut and has flown on four space shuttle missions. Most recently, he commanded STS-81 which docked with the Mir Space Station in January 1997. He spent eight months in Star City for in 1995 as director of operations for JSC.



Baker



Cockrell

Cockrell becomes chief of the Astronaut Office, replacing Astronaut Bob Cabana, who is beginning full time training as commander on STS-88, the first International Space Station assembly flight.

Cockrell had been acting deputy chief of the Astronaut Office.

From November 1987 to July 1990, Cockrell worked as an aerospace engineer and research pilot at Ellington Field, Houston.

Cockrell became an astronaut in July 1991, and is a veteran of three space flights with more than 906 hours in space. He was a mission specialist on STS-56 in 1993, pilot on STS-69 in 1995, and commanded STS-80 in 1996.

Dates & Data

Oct. 10

Astronomers meet: The JSC Astronomical Society will meet at 7:30 p.m. Oct. 10 at the Lunar and Planetary Institute, 3600 Bay Area Blvd. For more information, call Chuck Shaw at x35416.

Oct. 14

NPMA meets: The National Property Management Association will meet at 5 p.m. Oct. 14 at Robinette and Doyle Caterers, 216 Kirby in Seabrook. Dinner costs \$14. For more information call Sina Hawsey at x36582.

Aero club meets: The Bay Area Aero Club will meet at 7 p.m. Oct. 14 at the Houston Gulf Airport clubhouse at 2750 FM 1266 in League City. For more information call Larry Hendrickson at x32050.

Oct. 15

Safety day: JSC Safety and Total Health Day will be Oct. 15. All JSC organizations will stand down for discussions and presentations about safety and employee health and well-being.

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. Oct. 15 at the House of Prayer Lutheran Church. For details, call Jeannette Darcy at x45752.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. Oct. 15 at United Space Alliance, 600 Gemini. For details, call Patricia Blackwell at 281-282-4302 or Brian Collins at x35190.

Communicators meet: The Clear Lake Communicators will meet at 11:30 a.m. Oct. 15 at Lockheed Martin, 555 Forge River Road. For more information, contact Richard Lehman at 281-333-6004 or Melissa Sommers at 281-332-0698.

Sommers at 281-332-0698.

Astronomy seminar: The JSC Astronomy Seminar will meet at noon Oct. 15 in Bldg. 31, Rm. 129. Kelly Knight will discuss "Astronomy and Committing an Unnatural Act: Reducing Light Pollution through Effective Communication." For details, call Al Jackson at x35037.

Scuba club meets: The Lunarfins will meet at 7:30 p.m. Oct. 15 at the Redfish Restaurant under the Kemah/Seabrook bridge. For details, call Fred Toole at x33201.

Oct. 16

Directors meet: The Space Family Education board of directors will meet at 11:30 a.m. Oct. 16 in Bldg. 45, Rm. 712D. For more information on this open meeting, call Gretchen Thomas at x37664.

AIAA meets: The American Institute of Aeronautics and Astronautics will meet for a brown bag lunch-and-learn seminar at 11:30 a.m. Oct. 16 in Bldg. 4S, Rm. 4519. Dr. Neal R. Pellis, program manager of JSC's Biotechnology Cell Science Program, will speak on "Basic Biological Considerations for Long-Term Space Travel."

NMA meets: The Texas Gulf Coast Council of the National Management Association will host a joint chapter meeting at 5:30 p.m. Oct. 16 at the Radisson Hotel and Conference Center at Hobby Airport. Arthur Mortell will speak on the "Gifts of Adversity." For more information, call Norm Chafree at x33777.

Oct. 22

Spaceland Toastmasters meet: The Spaceland Toastmasters will meet at 7 a.m. Oct. 22 at the House of Prayer Lutheran Church. For more information, call Jeannette

Darcy at x45752.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. Oct. 22 at United Space Alliance, 600 Gemini. For details, call Patricia Blackwell at 281-282-4302 or Brian Collins at x35190.

Communicators meet: The Clear Lake Communicators will meet at 11:30 a.m. Oct. 22 at Lockheed Martin, 555 Forge River Road. For more information, contact Richard Lehman at 281-333-6004 or Melissa Sommers at 281-332-0698.

Astronomy seminar: The JSC Astronomy Seminar will meet at noon Oct. 22 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For details, call Al Jackson at x35037.

Oct. 23

Radio club meets: The JSC Amateur Radio Club will meet at 6:30 p.m. Oct. 23 at Piccadilly Cafeteria, 2465 Bay Area Blvd. For details, call Larry Dietrich at x39198.

AIAA meets: The American Institute of Aeronautics and Astronautics will meet Oct. 23 at Silver Moon Cafe at Space Center Houston. Dr. Norm Thagard, the first American to live and work onboard Mir, will discuss "Life on the Mir." For details call 281-333-6421.

Oct 29

Communicators meet: The Clear Lake Communicators will meet at 11:30 a.m. Oct. 29 at Lockheed Martin, 555 Forge River Road. For more information, contact Richard Lehman at 281-333-6004 or Melissa Sommers at 281-332-0698.

Astronomy seminar: The JSC Astronomy Seminar will meet at noon Oct. 29 in Bldg. 31, Rm. 129. For details, call Al Jackson at x35037.

Heritage group seeks Oklahomans for book

The Oklahoma Heritage Association is searching for Oklahomans employed by NASA, past or present in any capacity. The association is working on a book detailing Oklahoma's contribution to the space program, for its Oklahoma Horizons Series.

The contact person for this project is Gini Campbell. She can be

reached toll-free at (888)501-2059, or by mail at 201 Northwest 14th Street, Oklahoma City, Okla., 73103. An information packet will be mailed for completion and return.

They also are interested in hearing from anyone born in Oklahoma, or who attended school or lived there.

People on the Move

Human Resources reports the following personnel changes as of September 30.

Promotions

Stephen Chan was selected as a lead program analyst in the Business Management Directorate.

Jennifer Kainer was selected as a lead program analyst in the Business Management Directorate.

Resignations Between Directorates

Deborah Gutierrez moves from the Space Shuttle Program Office to the International Space Station Program Office.

Diep Nguyen moves from Mission Operations Directorate to the International Space Station Program Office.

Jay Wright moves from the Safety, Reliability, and Quality Assurance Office to the International Space Station Program Office.

Edgardo Yballe moves from the Space Shuttle Program Office to the International Space Station Program Office.

Retirements

Clarence Modlin of the Engineering Directorate.

Resignations

Jeffrey Johnson of the Business Management Directorate.

John Blaha of the Flight Crew Operations Directorate.

Jeffrey Dominick of the International Space Station Program Office.

Deborah Bourland of the Space and Life Sciences Directorate.

NASA Briefs

White House approves Cassini Saturn launch

NASA received formal approval from the White House Office of Science and Technology Policy on Oct. 13 to proceed toward the Oct. 13 launch of the robotic Cassini mission to explore Saturn and its moon Titan. NASA Administrator Dan Goldin said, "I am confident in the safety of the Cassini mission, and I fully expect that it will return spectacular images and scientific data about Saturn, in the same safe and successful manner as the Voyager, Galileo and Ulysses missions." White House launch approval is required by presidential directive due to the Radioisotope Thermoelectric Generators used to provide electrical power for the Cassini spacecraft and its scientific instruments, and the radioisotope heater units that it carries to keep the spacecraft's instruments and electronics warm in deep space.

Antarctic radar survey images arrive

Initial images from the first complete radar survey of Antarctica, using the Canadian Space Agency's Radarsat mission, show better-than-expected details of its massive ice streams and crevices, as well as old, buried features of the international South Pole research station established in the late 1950s. "The quality of these first images is quite stunning," said Dr. Robert Thomas, program manager for polar research in NASA's Office of Mission to Planet Earth. "Antarctica is the only continent on Earth that has not been properly mapped. Despite many years of research, we still do not know whether this massive ice sheet is growing larger or smaller. Radarsat's Antarctic Mapping Mission should help us answer this question." Images and further information are available on the Internet at: <http://radarsat.space.gc.ca>.

Correction

Updated information is now available about the upcoming JSC On-Site Blood Drive highlighted on Page 2. Donations will be accepted from 7:30 a.m.-3:30 p.m. Oct. 15, and from 8 a.m.-3:30 p.m. Oct. 16 in the Teague Auditorium lobby. The collection of blood takes seven to 10 minutes, with the whole process usually taking about 45 minutes. For details, call Dan Mangieri at x33003, or Amy Mendez at x32604. To donate plasma or platelets, call Donna Stuart at x33032. No appointment is necessary for whole blood donations.

Fly-around reveals possible Spektr leak area

(Continued from Page 1)

Russian counterparts to deliver a replacement motion control computer and a record amount of supplies and other equipment, retrieve the Mir Environmental Effects Payloads during the first ever multinational shuttle-based space walk and tried to spot the leak in Mir's Spektr module.

Atlantis blasted off on time from the Kennedy Space Center Sept. at 9:34 p.m. CDT Sept. 25, just hours after NASA Administrator Daniel S. Goldin gave final clearance to launch, lighting up the central Florida coastline.

Wetherbee guided *Atlantis* to a smooth docking with Mir at 2:58 p.m. CDT Sept. 28. Less than two hours after docking, Wetherbee and Solovyev opened their respective

spacecraft's hatches and shook hands, Wetherbee handing Solovyev a new guidance system computer.

One day later, Wolf transferred his custom-made Soyuz seat liner to Mir, officially joining Solovyev and Vinogradov as a member of the Mir 24 crew and ending Foale's 134 days as a Mir crew member. Wolf quickly set up shop in Kvant-2, which he will use as sleeping quarters and laboratory.

Over the next few days, Foale acquainted Wolf with his new home while other members of the crew transferred nearly three tons of logistical supplies to Mir, and 1,717 pounds of water. *Atlantis* returned to Earth with nearly a ton of U.S. science items and 900 pounds of Russian samples.

On Oct. 1, Parazynski and Titov

spent 5 hours and one minute in the shuttle's cargo bay and at the docking module, collecting four suitcase-sized Mir Environmental Effects Payloads. The experiment had been placed outside the Mir by another pair of shuttle space walkers a year and a half ago to collect data about how the space environment affects a space station.

Titov and Parazynski also affixed a Solar Array Cap to the docking module for possible use in sealing off a suspected breach in the hull of the Spektr module, damaged in a June 25 collision with a Progress resupply ship.

As Titov and Parazynski worked outside, Solovyev and Vinogradov installed a new motion control computer in the Mir's Core Module, replacing one that had experienced problems.

On Oct. 2, with their work concluded, Wetherbee and Solovyev shook hands for a final time at 5:45 p.m. and closed the hatches between the two spacecraft. The next day, *Atlantis* undocked one orbit later than originally planned, at 12:28 p.m. CDT. Russian flight controllers had requested the delay so cosmonauts could finish installing a new data relay unit in the Kvant-1 module.

As Bloomfield flew around the station, Solovyev opened a pressure valve, blowing air into the depressurized Spektr module. Titov aboard *Atlantis* and Vinogradov aboard Mir both reported seeing particles or debris seeping from the base of the damaged solar array on Spektr, the most likely location for a hull breach.

Halloween on Mars set for Oct. 23

By Wendy Hall

Get ready for an out-of-this-world experience as JSC's Employee Activities Association and Space Center Houston launch an array of Halloween activities for the entire family during "Halloween on Mars."

For NASA employees from 5:30-8:30 p.m. Oct. 23, Space Center Houston will transform into a giant Halloween event that celebrates the discovery of pumpkins on Mars by Space Center Houston's wacky scientist I.B. Frazzled.

To kick-off the occasion, Space Center Houston has created six Martian-like settings where children will receive free candy, stickers, buttons and face painting. Two live shows have been especially designed for the event to entertain and educate children about Mars. In one of the shows, Professor I.B. Frazzled and MURPHY (Mars' Unique Resident who brings Pumpkins to Halloween Youngsters), will explain how pumpkins really can exist on Mars—with a little Halloween magic.

The whole family is invited, including civil servants, contractors, and friends at a cost of \$4 per child (ages 3-11), \$3 per adult



Photo courtesy Space Center Houston

MURPHY is seen in his pumpkin-shaped, intergalactic space vehicle getting final touches by Space Center Houston Exhibits Manager Pete Colangelo, center, as Space Center Houston Marketing Director Roger Bornstein, right, and set designer Beverly Smith watch the 4-foot-tall Martian come to life.

(ages 12-99), and \$2 for toddlers (ages 0-2). Tickets may be purchased at the Bldg. 11 Exchange Store through Oct. 22.

Costumes are encouraged, as pictures will be taken of costumed children (ages 0-11). Face painters and clowns will be available, the Employee Activities Association will serve

punch and cookies, and hand out other goodies. More substantial food will be available at the Silver Moon Cafe at a reduced price. The gift shop will be open at a 10-percent discount. The IMAX film "Mission To Mir" will be shown at 6:30 p.m. and 7:45 p.m. For details, call 281/244-2100.



Maps, catalogs detail safety activities

(Continued from Page 1)

A sampling of the booths or exhibits include Massage Therapy, Alzheimer's Association, American Red Cross, Bay Area Turning Point, Harris County Health Department, Lifegift, U.S. Divers Association, Greater Houston 911, U.S. Coast Guard Auxiliary, Hermann Life Flight Helicopter, Bay Area Equestrian Center, Texas-New Mexico Arc Demonstration, Galveston County Auto Crime Task Force and Cancer

Awareness/M.D. Anderson Cancer Center.

A catalog will be provided at various locations around the center on the day of the event. Inside will be a site map that indicates the location of each booth. If the weather does not look promising on Oct. 15, many of the booths that would have been located outside around the pond will be moved inside to the lobbies of the surrounding buildings. Again, maps will be

available to indicate the new locations of the booths if poor weather is encountered.

"This day will be exactly what the individual makes it," Neu said, "and if last year's participation was any indication, the 1997 Safety and Total Health Day should be an even more effective teaching and learning environment. In short, I think we can all look forward to a really great, and most enjoyable, event."

Chamber test continues work of three previous crews

(Continued from Page 1)

tions of those methods. The current test is using biological systems for the primary means of water recovery and a combination of mechanical and biological systems will be employed to revitalize the air.

A module containing wheat crops will be linked to the test chamber to provide up to 25 per cent of the crew's oxygen from the carbon dioxide produced by the crew in the 20-foot chamber. Water consumed by the crew will be recycled using a unique biological and physical/chemical water recovery system designed at JSC. Solid waste from the crew will be incinerated to produce additional carbon dioxide to sustain plant growth for air revitalization and food production.

The prime and backup crews also will conduct 14 demonstration pro-

jects during the test, including both physiological and psychological medical investigations and evaluations of food systems and of astronaut training techniques.

The team members are providing daily status reports on the operation of the life support systems, as well as crew habitability criteria. Kloeris plans to issue a weekly journal report every weekend.

"The Lunar Mars Life Support Test Project Phase III test is progressing very well so far," Kloeris said in her first journal report. "The air and water recycling systems seem to be doing great at this point. Our four member crew is doing well."

"I am the science coordinator for the mission and thus responsible for all the data that is collected during the test for the numerous experiments we are doing while we're 'in

the can," she continued. "In addition to the daily living items, we are performing a number of activities to support some 14 different experiments that will be conducted over the 90 day test. Some of the activities this past week included taking a number of microbiological samples in the chamber including air, water and surface samples; doing some dietary surveys of our eating habits in the chamber; and we did a 48 hour sleep study which involved us wearing some gear over our shoulders for two days that monitored our core body temperature from a little 'pill' that we swallowed."

"The pill contains a little transmitter which transmits our temperature to the unit we wear over our shoulder like a purse. The combination of the core body temperatures and saliva samples just about every hour on

the hour during the day, gives the researchers valuable data about the melatonin levels in our body and how they relate to body temperature and sleep patterns. The research is to be used to hopefully be able to track astronaut sleep patterns as an indicator of their mental health and stress levels on long duration missions," Kloeris reported.

The current test continues investigations begun on tests conducted in August 1995, June-July 1996, and January-March 1997.

The four-person crew will spend more than 90 days investigating regenerative life support, a critical enabling technology for future human deep-space missions since astronauts can't carry the supplies to support a trip to Mars or a base on the Moon. The latest information is on-line at: <http://pet.jsc.nasa.gov>

Space News ROUNDUP

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Editor Kelly Humphries